

ABSTRACT

Background: The gold standard for diagnosis of meningitis depends on cerebrospinal fluid (CSF) examination by microscopy, biochemistry, and culture, which require an experienced microscopist and laboratory support. We conducted this study to determine if urinary reagent strip is useful to make a semi-quantitative assessment of protein, glucose, and presence of leukocyte esterase in CSF.

Materials and Methods: All consecutive CSF samples were evaluated in a blinded fashion. CSF was tested using Combur-10 urinary reagent strip as an index test, and CSF microscopy and biochemistry as reference standards. finally strip results were compared with culture result. Combur-10 (Boehringer Mannheim) is a urinary reagent strip used to estimate ten parameters including protein, glucose, and leukocytes. We estimated diagnostic accuracy of each index test using corresponding cut-off levels (glucose $<1+$ vs. CSF glucose <50 mg/dL; protein $2+$ and $3+$ vs. CSF protein >30 mg/dL and >100 mg/dL; leukocyte esterase positivity vs. >10 granulocytes in CSF sample). We constructed receiver operating curves (ROC) to evaluate overall performance of index tests and estimated area under the curve (AUC). **Results:** CSF samples of 150 patients were included in the study. Of the three tests, diagnostic accuracy of protein estimation ($2+$ or more on reagent strip) was best for detection of CSF proteins greater than 50 mg/dL [sensitivity 93.2% (95% CI 86.63- 96.67); specificity 91.49% (95% CI 80.07, 96.64)], with AUC of 0.97. Leukocyte esterase positivity by test strip had a sensitivity of 90% (95% CI 82.08, 94.65) and specificity of 91.6% (95% CI 81.93, 96.39) for detection of CSF granulocytes of more than 10/mm³. **Conclusion:** Existing urinary reagent strips can be used to diagnose meningitis in low resource settings.

Key words: Cerebrospinal fluid, meningitis, urinary reagent strip